



# UNITED STATES PATENT AND TRADEMARK OFFICE

*clm*

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/563,176	05/23/2006	Paul Royo	P-2597	3766
2120	7590	11/20/2007		
PAUL A. FATTIBENE FATTIBENE & FATTIBENE 2480 POST ROAD SOUTHPORT, CT 06890			EXAMINER PARK, KINAM	
			ART UNIT 2828	PAPER NUMBER
			MAIL DATE 11/20/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/563,176

Applicant(s)

ROYO, PAUL

Examiner

Kinam Park

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 23 May 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/30/2005 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/30/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. **Claim 1** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Because the term of "the first reflector comprising" is not clear for the scope of comprising.

***Claim Objections***

3. Claims 1, 2, 4-9, 15, 16, 19, 23, 25, 26, are objected to because of the following informalities:

The meaning of a "characteristic lateral size" is not clear since non-circular shaped apertures (see, claim 21) are also within a scope of the claims which need at least two parameters to be defined in respect to their lateral size. The examiner assumes that the objected term is a "circular area defined by a characteristic diameter" since in figure 1e and claim 19 and 20 only one characteristic size, a diameter, is given.

Appropriate correction is required.

4. Claims 6 and 7 are objected to because of the following informalities:

The term of a "in the range of 6 (4)  $\mu\text{m}$ " is not clear since a range has a starting and an ending point, the scope of protection, like a claim 8.

Appropriate correction is required.

5. Claims 27-29, are objected to because of the following informalities:

The term of a characteristic "dimension" is not clear since in claim 23 only a characteristic "lateral size" is defined. The examiner assumes that the objected term is a "lateral size."

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claim 1-3, 12-13 are rejected under 35 U.S.C. 102(b) as being anticipated by SHIEH et al. (EP 000772266).

Regarding **claim 1**,

SHIEH et al. discloses in figure 2, 3 and specification:

1. Vertical cavity surface emitting laser, which emits the fundamental transverse radiation mode only, comprising:

a laser active region (32) , a resonator having a first reflector (31) and a second reflector (37),

the first reflector comprising

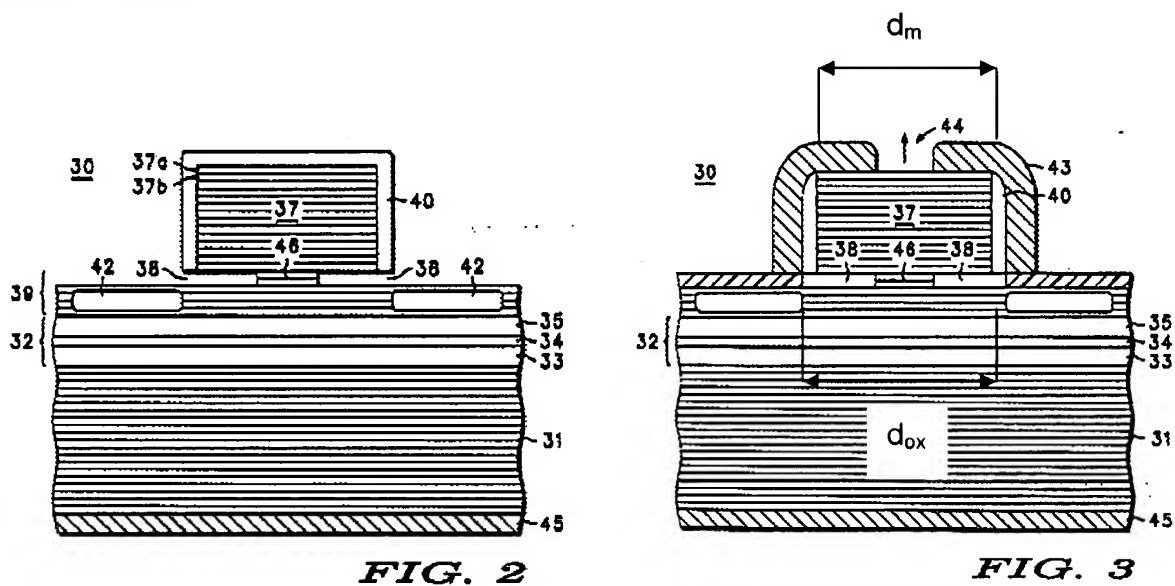
a first plurality of doped layers (31) having alternately a low index of refraction and a high index of refraction,

an aperture layer (42) located above said first plurality of doped layers (31) and formed of an insulating material that is substantially non-transparent for a specified wavelength range, the aperture layer having an aperture formed of conductive and optically transparent material with a first characteristic lateral size ( $d_{ox}$ ), and

a second plurality of doped layers (37) having alternately a low Index of refraction and a high Index of refraction (see, col. 3, lines 55-57), the second plurality having a second characteristic lateral size ( $d_m$ ), a difference of the first characteristic lateral size ( $d_{ox}$ ) (see, figure 2 and 3), and

the second characteristic lateral size ( $d_m$ ) being smaller than ( $d_{ox}$ ) (see, figure 2 and 3) and being adapted to generate increased optical losses of said resonator with respect to higher order modes for said specified wavelength range compared to the optical losses caused by said aperture layer alone, and

a radiation output window (44) formed above said first reflector or below said second reflector.



Regarding **claim 2-3, 12-13,**

Note that SHIEH et al. discloses in figure 2, 3 and specification a third characteristic lateral size (see, 44, Mesa, and 42) (**claim 2**), a metal layer (43) (**claim 3**), a second reflector (31) comprising a plurality of doped layers having alternatively a low index of refraction and a high index of refraction (see, many lines) (**claim 12**), the configuration of a substrate (inherent to grow layers) and a metal layer (45) (**claim 13**),

***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claim 4-11, 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over SHIEH et al. in view of Ueki (US 6816527).

Regarding **claim 4-8, 15-16,**

SHIEH et al. discloses the limitations of claim 1 for the reasons above.

However, SHIEH et al. is silent as to the different characteristic lateral sizes.

Ueki discloses the different aperture sizes depending upon the power and divergence angle (see, figure 4-8).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to combine the different aperture size of Ueki with a VCSEL of

SHIEH et al. because these provides a VCSEL having mode control (see, col.5, lines 4-8 of Ueki).

Regarding **claim 9-11**,

A third plurality of doped layer disposed between the aperture layer and the second plurality of doped layer (**claim 9**) is obvious in this art to reduce the current spread and the number of doped layers (**claim10-11**) is obvious in this art since this depends on the reflectivity requirement of the application.

Regarding **claim 14**,

Note that Ueki discloses a contact layer (6, figure 1A) (**claim 14**).

10. Claim 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over SHIEH et al. in view of Sopra et al. (Pub No. 20020172247).

Regarding **claim 17-18**,

SHIEH et al. discloses the limitations of claim 1 for the reasons above.

However, SHIEH et al. is silent as to a phase matching layer.

Sopra et al. discloses the phase matching layer arranged within the resonator (see, Abstract).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to combine the phase matching layer of Sopra et al. with a VCSEL of SHIEH et al. because this provides a means to generate a reflectivity difference of the first and/or second reflector at a resonator region corresponding to the radiation

emission window and the residual resonator region (see, paragraph [0009] of Sopra et al.).

Regarding **claim 19-22**,

Note that Sopra et al. discloses in figure 5a, 5b, 5c and specification the aperture having a circular shape (509) (**claim 19**), the radiation output window having a circular shape (508, in figure 5c) (**claim 20**), a non-circular shape (508, in figure 5a and 5b) (**claim 21, 22**).

Regarding **claim 23-29**,

Method **claims 23-28** are rejected for the same reasons applied above rejected apparatus claims 1-22 and process margin (**claim 29**) is obvious in this art since this has been well established in industry to accommodate the individual error of the component in manufacturing process.

### ***Conclusion***

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Boucart et al. (US 6487230) discloses the vertical cavity apparatus with tunnel junction.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kinam Park whose telephone number is (571) 270-1738. The examiner can normally be reached on from 9:00 AM-5:00 PM. If attempts to



Application/Control Number:  
10/563,176  
Art Unit: 2828

Page 8

reach the examiner by telephone are unsuccessful, the examiner's supervisor, **MINSUN HARVEY**, can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KP

KP

